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based on brines and gypsum. Whether an oil field lies under the surface is a question which only the explorations of the future can solve.

J. F. KEMP.

Veröffentlichungen aus dem Königlichen Museum für Völkerkunde. Berlin. 1895.

The above named publication by the Museum of Ethnography in Berlin appears quarterly in large folio form, and consists of special studies by experts in some of the lines of anthropologic science.

The last number, Band IV., Heft 1., deserves separate mention for the valuable contributions it contains to American archaeology. It presents three articles, each of which is a model in its way.

The first is a descriptive catalogue of a collection of idols, fetishes and priestly ceremonial objects from Zuñi, collected and explained by Mr. Frank Hamilton Cushing, and now deposited in the Berlin museum. It is illustrated with 26 drawings inserted in the text, and the purposes of the objects with their mythological associations are accurately set forth.

The second article is by Dr. Carl Sapper, on 'Ancient Indian Settlements in Guatemala and Chiapas.' It is accompanied by a most useful map of Chiapas, Tabasco, Guatemala and part of Honduras, giving the locations of the ancient native towns, caves containing remains, rock-drawings and localities deserving further investigations. To this are appended 20 plans of ancient ruined cities within the area mapped, a number of them entirely new, others more accurately drawn than in previous publications. Among them may be mentioned the famous Iximche, the capital of the Cakchiquels; Sacabajá, a city of the Quiches; Los Cuyes in the department of Huehuetenango; the rock-inscriptions of Zacualpa in Chiapas, and others. This archæological study will be of great use to future investigators.

The third article is an interesting study,

by the eminent Americanist, Dr. Carl Seler, of a series of vases and similar objects brought by Dr. Sapper from Guatemala. It is illustrated by 104 drawings inserted in the text, and the subject is elucidated by the thorough acquaintance with the literature of the conquest which the author always has at command. A number of these vases are decorated with hieroglyphs of the form characteristic of the Mayan tribes. Some of these the author identifies with others in the manuscripts and sculptures, and suggests explanations for them. He is inclined to believe that such inscriptions indicate that the vases were manufactured elsewhere than where they were found; an opinion which will not hold, in view of the large number of sherds bearing glyphs obtained from the southern Mayan territory. This essay is a most important contribution to the study of the Mayan hieroglyphs.

D. G. BRINTON.

SOCIETIES AND ACADEMIES.

THE ASTRONOMICAL AND PHYSICAL SOCIETY OF TORONTO.

At a meeting on June 11th the following notes on mass and temperature in the solar system were read by Mr. A. Elvins:

I have long thought that a relation exists between the masses of the heavenly bodies and their temperatures, the heat rising as the mass increases. Mercury is too near the Sun to be observed with much chance of success. Venus is somewhat better situated, but its brilliancy is so great that it is a difficult object to observe; its atmosphere, however, often shows dark patches, which I think may be openings through the general mass of clouds which seem to envelope the planet, reflecting light from their outer surface. Like the earth, I think it has polar caps of snow; I have seen a bright spot at the north pole on several occasions during the past fortnight, and similar observations have been previously

noted by other observers and myself. The mass of Venus approaches nearer to that of the earth than the mass of any other planet, and it will probably not be very different from the earth in its temperature.

In the case of the moon the temperature is probably very low. Peal and others regard it as glaciated. Langley says at full moon the temperature is not above 0° centigrade. I need not remind you that the mass of the moon is very small. The mass of Mars is only about one-ninth that of the earth, and it may be on the whole a colder world. The vast polar caps have a great resemblance to snow; they enlarge during the winter and decrease during the summer. The canals, about which so much has been written, are just as likely to be rents or fissures in ice fields, or vast ice crystals on the surface of liquid, as to be vegetation near artificial streams.*

Jupiter is the giant world, and if the temperature increases with mass its heat must be very great. Careful scrutiny sustains this view; no polar snow caps can be seen; the belts and spots show so many changes that the best observers regard the planet as a very hot body. Proctor even contended that it radiated heat to the satellites, and was in that respect an additional sun to them.

This speculation is of great interest to me and I would be pleased sometime to continue the subject, but I think enough has been said to show that it is not void of interest, and that going outwards from the Sun temperature seems to increase with mass. I need scarcely remind you that the mass of the Sun itself is vastly greater than that of all the bodies of the system combined, and that his heat is enormous.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL FOR JULY.

THE July number of the American Chemical Journal contains an article by W. F.

Edwards entitled 'Notes on Molecular and Atomic Refractions.' He offered, sometime ago, a new formula, $\frac{P(M-1)}{MD}$, for molecular refraction, and the present paper contains the results of further research and comparisons of the results obtained by the use of his formula with those obtained with the formulæ of Gladstone and Lorentz-Lorenz. He has compared a number of cases of acids and ethereal salt and has determined the change caused by the addition of CH_2 , and the numbers representing the atomic refractions of hydrogen, oxygen, nitrogen, chlorine, bromine, iodine and sulphur, in terms of his formula.

By the use of his formula he can tell whether the nitrogen is present in the trivalent or univalent condition; but with the others this is impossible. Although a great number of observations are available the results are not such as would render any general conclusions possible in many cases. Hite, and Orndorff and Cameron, describe the pieces of apparatus which they have devised for determining molecular weights by the boiling-point method. They both call attention to the great influence of pressure on the boiling point and the necessity of making corrections for it. The two methods vary in details, the apparatus of Orndorff and Cameron being much simpler and easily made by any student, while specially constructed apparatus is needed for Hite's method. Numerous examples are given by both of very satisfactory results obtained.

Seldner has tried parallel experiments to those of Gautier in which diacetamide is formed by heating acetonitrile and acetic acid together. He used glutaric acid and its nitrile, and whether he mixed glutaric acid and acetonitrile, or glutaric nitrile and acetic acid, or glutaric acid and glutaric nitrile, in each case he obtained the same product, the glutaramide. DeChalmot, who has been studying the pentoses of plants, advanced the hypothesis that in